

CLAIMS

What is claimed is:

1. An interactive bid evaluation system for a combinatorial auction, comprising:
 - 5 a display for scaling a plurality of bids and items, on a display window.
 2. The system of claim 1, wherein said display scales viewable objects representing said bids and items, such that as a number of bids and items increases, a size of said viewable objects representing said bids and objects decreases.
 - 10 3. The system of claim 1, wherein each of said bids and items is displayed, regardless of a number of said bids and items.
 4. The system of claim 1, wherein said display includes a real-time recommendation window for providing at least one recommendation on what action to take next in generating an ad hoc solution.
 - 15 5. The system of claim 1, wherein said display displays supporting information including any of items, bids, constraints, analysis, and results, and

candidate optimal solutions on said display, to allow interactive selection of an optimal solution from the bid evaluation system,

said supporting information providing a visualization of how the optimal solution satisfies a demand for each item and each constraint thereon.

5 6. The system of claim 1, wherein said display comprises a user interface for presenting solutions and supporting information in an intuitively understandable visual representation, and for providing visual operations on graphical entities of the visual representation.

10 7. The system of claim 1, further comprising a processor coupled to said display,

wherein said display comprises a mechanism for enabling a user to interactively generate an *ad hoc* solution by using visual operations, and for comparing the solutions with an optimal solution generated by said processor.

15 8. The system of claim 1, wherein said display includes:
 a dynamic mechanism for enabling a user to dynamically update auction parameters including any of items in the auction, bundle bids under consideration, and changing constraints and a reserve price; and
 a mechanism for generating *ad hoc* and optimal solutions iteratively for exploratory analysis.

9. The system of claim 1, wherein said display includes a mechanism for enabling a user to generate interactively an optimal solution for an auction after pre-assigning at least one bundle bid to a winning bid pool.

10. The system of claim 4, further comprising a user input device coupled to
5 said display,

wherein said display includes a mechanism for enabling a user to enforce said at least one recommendation by using said user input device.

11. The system of claim 1, wherein said display comprises an iconic user interface including an analysis window which allows said scaling.

10 12. The system of claim 11, wherein said iconic user interface further comprises any of an item list window, a bid list window, a constraint window, a result window, a result detail window, a recommendation window, an item detail window, and a bid detail Window interactively coupled to said analysis window.

15 13. The system of claim 12, wherein said analysis window displays a bundle demand and a set of submitted bundle bids,
wherein said item list window displays a list of all items the user desires to procure and a demanded amount for each item,

said item list window allowing the user to any of select and de-select at least one item that the user desires to any of include and exclude, respectively, in the analysis window, and

5 wherein, as the bundle demand in the analysis window is updated by the user's item selection operation in the item list window, the set of bundle bids displayed in the analysis window is updated.

14. The system of claim 12, further comprising a pointing device, wherein said item detail window is openable from the item list window by using an operation of said pointing device,

10 said item detail window for displaying information about a particular item,

wherein said bid list window displays a list of all the submitted bundle bids and allows the user to any of select and de-select at least one bid that the user wants to any of include and exclude, respectively, in the analysis window, 15 and

wherein said bid detail window is openable from the bid list window by using an operation of said pointing device, and displays various information about a particular bid, including a bid thumbnail image, a supplier information, and a product information bundled in a bid.

20 15. The system of claim 14, wherein the constraint window displays a list of constraints applicable to the current auction setting presented in the analysis

window, and enables the user to dynamically update values of constraints and apply the values to the bid evaluation in the analysis window,

wherein the result window groups and displays, in a hierarchical tree structure, solutions for various combinatorial auction bid evaluation problems

5 set up in the analysis window, so as to classify different solutions hierarchically in the result window,

wherein a new bid evaluation problem is created by changing the values in the item list window, the bid list window, and the constraint window, and

10 wherein when a bid evaluation problem is determined in the analysis window, said bid evaluation problem is selectively added to the result window.

16. The system of claim 15, wherein the result detail window is openable from the result window by using said pointing device to present detailed information on a particular solution,

15 wherein the recommendation window provides at least one recommendation for each iteration in generating an ad hoc solution for a combinatorial auction bid evaluation problem, to allow said user to directly enforce the recommendation in the recommendation window, and

20 wherein if a predetermined supplier makes a bid, then said bid by said predetermined supplier is automatically selected.

17. A method of interactive bid evaluation for a combinatorial auction,
comprising:
scaling a plurality of bids and items displayed on a display window.

18. The method of claim 17, wherein said scaling comprises scaling viewable
5 objects representing said bids and items such that as a number of bids and
items increases, a size of said viewable objects representing said bids and
items decreases.

19. The method of claim 17, wherein each of said bids and items is displayed
regardless of a number of said bids and items, said method further comprising:
10 providing a real-time recommendation window for providing at least
one recommendation on what action to take next in generating an ad hoc
solution;
displaying supporting information including any of items, bids,
constraints, analysis, and results, and optimal solutions on said displays, to
15 allow interactive selection of an optimal solution from the bid evaluation
system, said supporting informant providing a visualization of how the
optimal solution satisfies a demand for each item and each constraint thereon;
presenting solutions and supporting information in an intuitively
understandable visual representation, and providing visual operations on
20 graphical entities of the visual representation;

interactively generating, by a user, an *ad hoc* solution by using visual operations, and comparing the solutions with a computer-generated optimal solution;

enabling a user to dynamically update auction parameters including

5 any of items in the auction, bundle bids under consideration, and changing constraints and a reserve price, and generating *ad hoc* and optimal solutions iteratively for exploratory analysis;

generating interactively an optimal solution for an auction after

10 pre-assigning at least one bundle bid to a winning bid pool; and

enforcing at least one recommendation by using said user input device.

20. A signal-bearing medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform a method of interactive bid evaluation for a combinatorial auction according to claim 17.

15 21. A method of deploying computing infrastructure in which computer-readable code is integrated into a computing system, such that said code and said computing system combine to perform a method of interactive bid evaluation for a combinatorial auction, according to claim 17.

22. A method of evaluating bids in a combinatorial auction, comprising:

20 structuring bid and item information on a visual interface of a display; and

providing an analysis capability for facilitating evaluation and selection of
at least one solution encompassing bids,
wherein said visual interface allows a user to directly manipulate data
points in the visual interface to explore an information space of potential
5 solutions and suppliers and to discover at least one solution optimal to the
user's needs.

23. A signal-bearing medium tangibly embodying a program of
machine-readable instructions executable by a digital processing apparatus to
perform a method of evaluating bids in a combinatorial auction according to
10 claim 17.

24. A method of deploying computing infrastructure in which
computer-readable code is integrated into a computing system, such that said
code and said computing system combine to perform a method of evaluating
bids in a combinatorial auction according to claim 17.

15